Computer Engineering Department
Faculty of Engineering, Mahidol University

LAB06: Color image Processing (part1)

Objectives

The goals of this lab, you will be able to:

1. Write a user-defined function in MATLAB for converting an RGB image to an YcbCr image**,** and the RGB image to an HSI image.
2. Write a program in MATLAB to highlight a particular range of gray levels in image using multi level intensity slicing.

Exercises

Note that you should create your own function in MATLAB as MATLAB User-defined function. It means that you cannot call MATLAB built-in function, which generates output in the same manner as your own function. You can use the images provided in the folder **\Google Drive\EGCI486-Image Processing\Second(2015-2016)\LABs\LAB06_Part1** for your exercises.

1) Conversions between color models

1.1 Write a user-defined function in MATLAB for converting the RGB image to the YcbCr image, with the following function name: Myrgb2ycbcr.m. Using this program on the image "flowers.tif" should give you result as shown in Figure 1.

1.2 Write a user-defined function in MATLAB for converting the YCbCr image to the RGB image, with the following function name: Mycbcr2yrgb.m.

1.3 Write a user-defined function in MATLAB for converting the RGB image to the HSI image, with the following function name: Myrgb2hsi.m. Using this program on the image "flowers.tif" should give you result as shown in Figure 2.

1.4 Write a user-defined function in MATLAB for converting the HSI image to the RGB image, with the following function name: Myhsi2rgb.m.

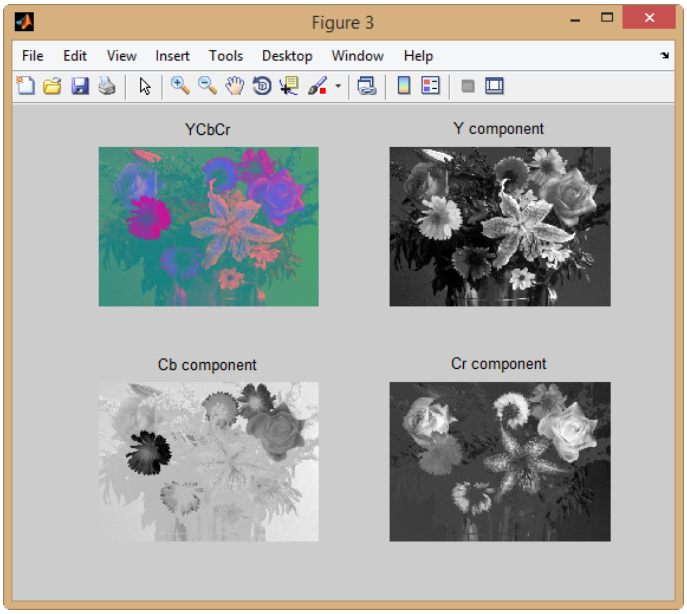

Figure 1: The result image of converting color from RGB to YCbCr.

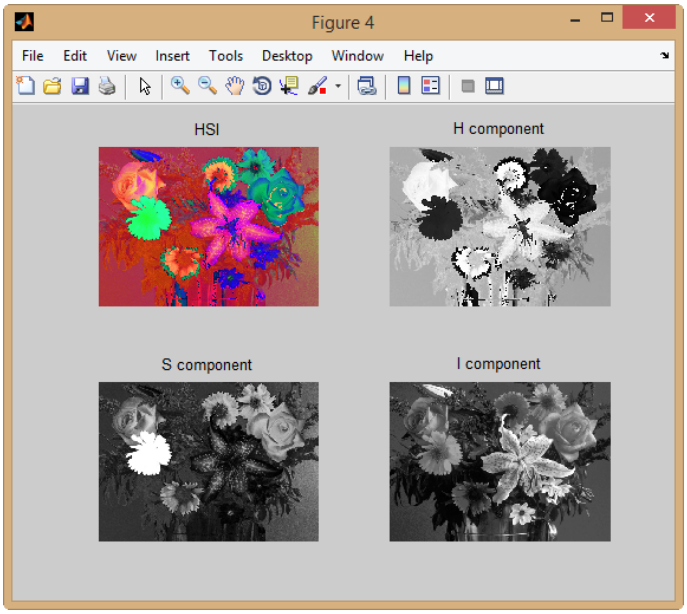

Figure 2: The result image of converting color from RGB to HSI.

2) Pseudo-color image processing using multi level intensity slicing

2.1 To highlight a particular range of gray levels in image, write a program in MATLAB to assign colors to gray values based on a specific criterion using multi level intensity slicing. The pseudo-color image processing can be done by assigning a blue color instead of gray values in range 0 and 30, a yellow color instead of gray values in range 100 and 140, and leaving all

other values unchanged. Take the following program name: Procolorslicing.m. When this program is used with the image “MRI.bmp” result as shown in Figure 3.

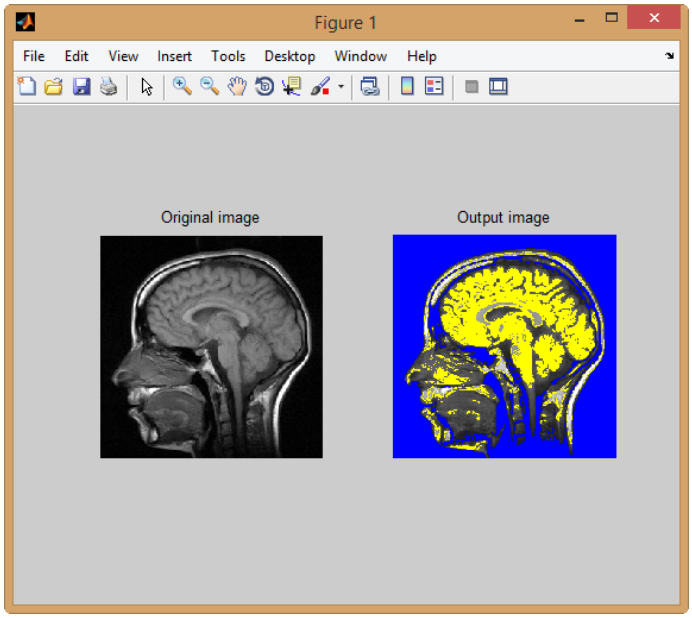

Figure 3 : The result image of applying the multi level intensity slicing in which the particular range of gray levels is highlighted, while leaving all other values unchanged.